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parents  
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ALLOWED CLAIMS

39. An apparatus comprising:

a plurality of storage units for storing a plurality of data groups and error correcting data for each of the data groups;

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monitoring means for monitoring operation of the storage units and producing an output when a failure has occurred in any of the storage units;

data reconstructing means for reconstructing data stored in any of the storage units in which a failure has occurred based on (1) data stored in other ones of the storage units in which a failure has not occurred and (2) the error correcting data stored in the storage units; and

control means, responsive to the output of the monitoring means, for controlling the data reconstructing means to switch between a first mode wherein the data reconstructing means reconstructs the data stored in any of the storage units in which a failure has occurred while not allowing a host unit to access the storage units, and a second mode wherein the data reconstructing means reconstructs the data stored in any of the storage units in which a failure has occurred while allowing the host unit to access the storage units.

40. An apparatus comprising:

a plurality of storage units for storing a plurality of data groups and error correcting data for each of the data groups;

monitoring means for monitoring operation of the storage units and producing an output when a failure has occurred in any of the storage units;

data reconstructing means for reconstructing data stored in any of the storage units in which a failure has occurred based on (1) data stored in other ones of the storage units in which a failure has not occurred and (2) the error correcting data stored in the storage units; and

control means, responsive to the output of the monitoring means, for setting a ratio of (1) an amount of frequency of processing of access to the storage units during a unit time to (2) an amount of data reconstructing during the unit time, and controlling the data reconstructing means to reconstruct the data stored in any of the storage units in which a failure has occurred and to allow the host unit to access the storage units in accordance with the ratio.

41. An apparatus comprising:

a plurality of storage units for storing at least one of (1) a plurality of data groups and (2) error correcting data for each of the data groups;

monitoring means for monitoring operation of the storage units and producing an output when a failure has occurred in any of the storage units;

data reconstructing means for reconstructing data stored in any of the storage units in which a failure has occurred based on (1) data stored in other ones of the storage units in which a failure has not occurred and (2) the error correcting data stored in the storage units; and

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control means, responsive to the output of the monitoring means, for controlling the data reconstructing means to switch between a first mode wherein the data reconstructing means reconstructs the data stored in any of the storage units in which a failure has occurred while not allowing a host unit to access the storage units, and a second mode wherein the data reconstructing means reconstructs the data stored in any of the storage units in which a failure has occurred while allowing the host unit to access the storage units.

42. An apparatus comprising:

a plurality of storage units for storing at least one of (1) a plurality of data groups and (2) error correcting data for each of the data groups;

monitoring means for monitoring operation of the storage units and producing an output when a failure has occurred in any of the storage units;

data reconstructing means for reconstructing data stored in any of the storage units in which a failure has occurred based on (1) data stored in other ones of the storage units in which a failure has not occurred and (2) the error correcting data stored in the storage units; and

control means, responsive to the output of the monitoring means, for setting a ratio of (1) an amount of frequency of processing of access to the storage units during a unit time to (2) an amount of data reconstructing during the unit time, and controlling the data reconstructing means to reconstruct the data stored in any of the storage units in which a failure has occurred and to allow the host unit to access the storage units in accordance with the ratio.

43. An apparatus comprising:

a plurality of storage units each for storing at least one of (1) data and (2) error correcting data for the data;

monitoring means for monitoring operation of the storage units and producing an output when a failure has occurred in any of the storage units;

data reconstructing means for reconstructing data stored in any of the storage units in which a failure has occurred based on (1) data stored in other ones of the storage units in which a failure has not occurred and (2) the error correcting data stored in the storage units; and

control means, responsive to the output of the monitoring means, for controlling the data reconstructing means to switch between a first mode wherein the data reconstructing means reconstructs the data stored in any of the storage units in which a failure has occurred while not allowing a host unit to access the storage units, and a second mode wherein the data reconstructing means reconstructs the data stored in any of the storage units in which a failure has occurred while allowing the host unit to access the storage units.

44. An apparatus according to claim 43, wherein the data stored in the storage units is divided data, the divided data being data divided into one of bit units, byte units, and arbitrary units stored in separate ones of the storage units.

45. An apparatus comprising:

a plurality of storage units each for storing at least one of (1) data and (2) error correcting data for the data;

monitoring means for monitoring operation of the storage units and producing an output when a failure has occurred in any of the storage units;

data reconstructing means for reconstructing data stored in any of the storage units in which a failure has occurred based on (1) data stored in other ones of the storage

units in which a failure has not occurred and (2) the error correcting data stored in the storage units; and

control means, responsive to the output of the monitoring means, for setting a ratio of (1) an amount of frequency of processing of access to the storage units during a unit time to (2) an amount of data reconstructing during the unit time, and controlling the data reconstructing means to reconstruct the data stored in any of the storage units in which a failure has occurred and to allow the host unit to access the storage units in accordance with the ratio.

46. An apparatus according to claim 45, wherein the data stored in the storage units is divided data, the divided data being data divided into one of bit units, byte units, and arbitrary units stored in separate ones of the storage units.